

## Abstract

The present invention provides an intrusion detecting system and method for precisely locating an intruder along the length of a sensor cable and for determining the intruder distance from the cable to precisely locate multiple, simultaneously occurring intrusions. The method includes the steps of: generating a TX signal and transmitting same over a first transmission line of the sensor cable, for creating an electromagnetic field; detecting an RX signal induced in a second transmission line of the cable by the electromagnetic field and identifying in the RX signal a contra-directional reflection received from a target and a co-directional reflection received from the far-end (F) of the first transmission line, processing the contra-directional reflection for providing a first coordinate (R) of the target, and processing the co-directional reflection for providing a second coordinate (Z) of the target. The method and system may also be implemented with a “true one cable” using a single coaxial cable sensor with a directional coupler for separating coupled signals along a single transmission line in the cable. Ultra high speed data correlation of the RX signal is achieved through use of a field programmable gate array. The present invention also provides a separate calibrated threshold for every meter of cable to reduce the installation cost associated with meticulous control and the number of cables required for sites with varying burial mediums. In another embodiment, the use of two parallel single cables may be utilized whereby each cable in the system is used to detect and locate intruders independently and more clearly define the direction of crossing and the speed of crossing.